A. **Title**: Application for Permit for Scientific Purposes under the Endangered Species Act of 1973. (If the proposal is for field surveys, genetics research, etc.)

Project Name

Adult salmonid monitoring on the Grays River, WA, through the use of an in-stream weir.

B. **Species**: List all species and Evolutionarily Significant Units (ESUs) and/or populations for which you request take authority.

1. Lower Columbia Chinook Salmon ESU (*Oncorhynchus tshawytcha*)- Grays River fall Chinook salmon

2. **Columbia River Chum Salmon ESU (*O. keta*) - Grays River chum salmon**

3. Lower Columbia Coho Salmon ESU (*O. kisutch*) - Grays River coho salmon

C. **Date of Permit Application**: July 9, 2008

D. **Applicant Identity**: The applicant is the individual and/or agency responsible for ensuring compliance with permit conditions, and may represent a group of individuals actually performing the activities (e.g., employees, partners, agents, and/or contractors). Please include the following information about the permit applicant:

Bryce Glaser
Washington Department of Fish and Wildlife
2108 Grand Blvd. Vancouver, WA 98661
360-906-6765 (office), 360-607-3822 (cell)
360-906-6776 (fax)
glasebgg@dfw.wa.gov
Résumé attached at the end of document.

E. **Information on Personnel, Cooperators, and Sponsors**: If the same person or entity will hold several roles, you may state their address information once and refer back to it.

1. **Principal Investigator:** Bryce Glaser (see above)

Field Supervisor : Todd Hillson

Todd Hillson
Washington Department of Fish and Wildlife
2108 Grand Blvd. Vancouver, WA 98661
360-906-6730 (office)
360-906-6776 (fax)
hillsth@dfw.wa.gov
Résumé attached at the end of document.

2. To the extent possible, provide a list of field personnel.
WDFW Fish Biologist 1: (1 position) to be hired.
WDFW Scientific Technician 2: (3 positions) to be hired.

3. Provide the name, title, agency, phone number, and any other appropriate contact information for all sponsors, cooperating institutions, etc.
Not Applicable

4. If the proposed activities will be conducted by a contractor, provide a statement that a qualified member of your staff (include name(s) and qualifications) will supervise or observe the taking. Include a copy of the proposed contract or a letter from the contractor indicating agreement to operate under any and all permit conditions, should a permit be granted.
Not Applicable

5. Provide a description of the arrangements for the disposition of any tissue samples, dead specimens, or other remains. If you will not retain samples, state that samples will be returned to their capture site (see section H.2.). If you are going to retain tissue samples (including whole fish), either in a museum or other institution for the continued benefit to science, include information on where the samples will be stored, transferred, and how/when/where they will be disposed. Include the list of researchers, laboratories, museums, and/or institutional collections that would receive these tissue samples or specimens. Please include name, address, contact, and phone number for each.
Tissue Samples:

Scale Samples:

Archived at the WDFW Region 5 office
2108 Grand Blvd. Vancouver, WA 98661
360-696-6211
contact: Bryce Glaser

Fin Tissue for Genetic Analysis:

Archived at the WDFW Genetics Lab
Natural Resources Building
1111 Washington St. SE
Olympia, WA 98501
360-902-2200
Contact: Norm Switzler

Mailing Address
600 Capitol Way N.
Olympia, WA 98501-1091

6. For transport and long-term holding of listed species (see Section I), provide the qualifications and experience of all staff responsible for care without supervision, including a written certification from a licensed veterinarian knowledgeable about the requested species (or similar species), or from a recognized expert on the species (or similar species) that he/she has personally reviewed the criteria for transporting and maintaining the animal(s) and that in his/her opinion they are adequate to provide for the well-being of the animal. Include the name, address, email, and phone number of this veterinarian, consulting expert, or equivalent who will be available during the proposed activities.

Not Applicable

F. **Project Description, Purpose, and Significance**:

The project has dual objectives: 1) to compliment existing adult salmonid monitoring efforts in the Grays River in developing accurate and precise estimates of total abundance, and 2) to promote recovery of the Grays River fall Chinook population through removal of non-local Chinook (hatchery strays) to increase productivity and inter-population diversity.

The WDFW contract with the Washington State Recreation and Conservation Office (RCO) is attached with this application.

The Washington Department of Fish and Wildlife (WDFW) is submitting this application describing the proposed adult salmonid monitoring program through the use of an in-stream weir in the lower Grays River (WA) to initiate the consultation process on listed species under the Endangered Species Act (ESA). This project is proposed to be ongoing with annual placement of the weir beginning in the fall of 2008. The proposed timeframe for operation in 2008 is August 15th through November 15th, at a minimum. If conditions allow, operation may continue through November/December. The project has dual objectives: 1) to compliment existing adult salmonid monitoring efforts in the Grays River in developing accurate and precise estimates of total abundance, and 2) to promote recovery of the Grays River fall Chinook population through removal of non-local Chinook (hatchery strays) to increase productivity and inter-population diversity.

The Grays River supports ESA listed populations of fall Chinook (*Oncorhynchus tshawytcha),* chum (*O. keta*), and coho (*O. kisutch*) salmon. [Note: Steelhead (O. mykiss) native to the Grays River are part of the SW Washington DPS and are not listed under the ESA]. All three of the listed species have been identified as primary populations for salmon recovery by the Lower Columbia Fish Recovery Board (LCFRB). The LCFRB was established to develop and implement a recovery plan for listed populations. In December 2004, the State of Washington submitted the LCFRB Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan to the National Oceanic and Atmospheric Administration (NOAA)–Fisheries to address the recovery of salmon and steelhead populations in this domain (LCFRB 2004). This plan is the primary document guiding salmon recovery efforts in the Lower Columbia River Basin in

Washington. Chapter seven of the plan outlines research, monitoring, and evaluation necessary to track recovery. Adult and juvenile salmonid ("fish in/ fish out") monitoring are identified as key components of the biological monitoring plan for Grays River salmonid populations and builds on the existing salmonid monitoring program in Washington's Lower Columbia River domain. Grays River Chinook, coho, and chum populations have also been selected for abundance and freshwater productivity monitoring under the Washington State Framework for Monitoring Salmon Populations developed by the Governor's Forum on Monitoring Salmon Recovery and Watershed Health (Crawford 2007). Recognizing that resources are insufficient to monitor every population, the framework selected representative populations for monitoring within each Major Population Group and Evolutionary Significant Unit.

In addition to identifying monitoring needs, the LCFRB recovery plan provides an extensive review of current habitat conditions and limiting factors affecting salmonid populations and outlines an integrated strategy to begin addressing them. The LCFRB has developed a 6-Year Habitat Work Schedule and Lead Entity Habitat Strategy (**http://www.lcfrb.gen.wa.us/2008%20HWS.htm**) that identifies key priorities for each Lower Columbia River (LCR) subbasin. For the Grays River the following key priorities were identified:

1. Manage Forest Lands to Protect and Restore Watershed Processes
2. Restore Valley Floodplain Function, Riparian Function and Stream Habitat Diversity
3. Manage Growth and Development to Protect Watershed Processes and Habitat Conditions
4. Help Address Immediate Risks with Short-term Habitat Fixes
5. Align Hatchery Priorities with Conservation Objectives
6. Manage Fishery Impacts so they do not Impede Progress Toward Recovery
7. Reduce Out-of-Subbasin Impacts so that the Benefits of In-Basin Actions can be Realized

A LCFRB sponsored work group has been established for the Grays River to involve all interested parties in the development and implementation of coordinated habitat recovery projects within the watershed. Several on-the-ground habitat restoration projects have been completed and/or are underway, many others have been proposed. To better coordinate habitat projects within the basin, a watershed assessment is being conducted (sponsored by LCFRB and funded by the Salmon Recovery Funding Board (SRFB)) to develop a prioritized list of potential habitat restoration actions within the watershed. A complete list of past, current, and proposed projects is available on the LCFRB webpage cited above. An important component of this habitat strategy is monitoring salmonid usage of newly restored habitats and trends in adult salmonid abundance throughout the habitat restoration/recovery process.

Along with habitat actions, key priorities 5-7 highlight the need to address hatchery, fishery and out-of-basin impacts to Grays River salmonid populations, so benefits of in-basin habitat actions can be realized. In direct relation to these priorities, the congressionally-established Hatchery Scientific Review Group (HSRG) has reviewed LCR hatcheries and developed hatchery reform principles that promote change towards conservation goals while still maintaining sustainable fisheries (**http://hatcheryreform.us**). Final recommendations are forthcoming, but draft recommendations are currently available. For Grays River fall Chinook, draft HSRG

recommendations note “hatchery strays are occupying available spawning grounds; however, they could be precluded by constructing a lower river weir”. They recommend installing a lower river weir to remove strays, and consideration of developing a small, integrated conservation program at the Grays River Hatchery, with broodstock collection at the weir (HSRG 2007).

With this project, WDFW proposes to install a lower river weir to address adult salmonid monitoring needs outlined in the LCFRB recovery plan and habitat strategy through development of accurate and precise abundance estimates, and to remove non-local (hatchery stray) fall Chinook from the natural spawning tule fall Chinook population, as recommended by the HSRG. In 2008, operation of the weir will be primarily focused on Grays River fall Chinook. Removal of hatchery strays, is intended to promote local adaptation of the natural spawning tule fall Chinook population, increasing productivity and inter-population diversity, and producing a population better suited to utilizing habitat (including restored areas) specific to the Grays River. More accurate estimates of abundance combined with biological and genetic data, and proportion of out-of basin stray information will be utilized to assess the potential for development of a conservation level supplementation program in the future. The weir is proposed to operate from late August/early September through mid-November, at a minimum. The Grays River is a rainfall dominated system with an extremely flashy streamflow response to significant rain events. If flows and conditions allow, operation of the weir may continue into late November/early December. In addition to fall Chinook, this timeframe overlaps with return/spawn timing of early coho and chum, and potentially with the front-end of the late coho and hatchery winter steelhead return. Enumeration and marking of these fish at the weir will contribute to improved estimates of abundance for these species as well. In future years, trap operations may be expanded to encompass the complete return/spawn timing of late coho, hatchery and wild winter-run steelhead, and out-of-basin stray spring Chinook and hatchery summer-run steelhead.

A river-spanning weir provides the ability to capture returning adult salmonids at a high rate. In some cases when the weir is “fish tight” (all fish are captured), direct census counts of a population are possible, all fish can be sampled (if necessary) and the ability to selectively remove and/or pass 100% of fish is provided. In instances when the weir is not fish tight, captured fish can be sampled, selectively sorted, and marked. When coupled with other monitoring activities (i.e. stream surveys, creel surveys, hatchery operations, etc.), marked fish released from the weir can be recaptured allowing for generation of abundance and weir trapping efficiency estimates through mark/recapture methodologies.

This project will compliment existing WDFW adult and juvenile monitoring efforts already occurring in the Grays River subbasin. WDFW has monitored various adult salmonid populations in the Grays River watershed at some level for more than 20 years; however, intensive monitoring necessary to develop more accurate and precise estimates of abundance has been relatively recent for some species. WDFW currently conducts stream surveys to estimate population abundance for adult chum, fall Chinook and wild winter-run steelhead in the Grays River. Natural spawning populations of coho (both hatchery and wild) and hatchery steelhead are not currently monitored. In February of 2008, WDFW began a two-year juvenile trapping

project sub-contracted through NOAA Fisheries (project sponsor) and funded by the Bonneville Power Administration (BPA) (Historic Habitat Food Web Linkage project (BPA Project #200301000)) to investigate juvenile salmonid outmigrant abundance, population structure, and life history strategies. The addition of a lower river weir, will allow WDFW to improve estimates for Grays River fall Chinook and chum populations, develop estimates of early coho (both hatchery and wild) abundance, and gather biological & genetic data and hatchery/wild proportion information for these species.

G. **Project Methodology**: Provide a detailed description of the project, or program, in which the listed species is to be used, including:

1. The proposed duration of the project or program, including start and end dates.

This project is proposed to be ongoing (10 years) with annual placement of the weir beginning in the fall of 2008. The proposed timeframe for operation in 2008 and beyond is August 15th (or as soon as permitted) through November 15th, at a minimum. If conditions allow, operation may continue through November/December, 2008. In future years, trap operations may be expanded to encompass the complete return/spawn timing of late coho, hatchery and wild winter-run steelhead, and out-of-basin stray spring Chinook and hatchery summer-run steelhead.

2. A discussion of the procedures and techniques which will be used during the project. Begin with a BRIEF description of the capture methods (seine, backpack electrofishing, etc.) and a brief description of any "intrusive methods" (anesthetic, tagging, marking, tissue samples, etc.). *For example: Listed fish will be captured (using boat electrofishing, fyke nets, and minnow traps), anesthetized, measured, checked for tags, marked, sampled for stomach content, and released.* Follow with more specific descriptions that will allow us to assess the activities. The discussion should include, at a minimum:

a. Method(s) of capture and of release;

A river-spanning weir and trap box will be placed in the Grays River to capture returning adult salmonids. In general, all salmonids captured will be sampled for biological data and/or genetic tissue and a portion will be externally tagged before release upstream. All fish (salmonids and other resident fish) will be released unharmed, except Chinook marked with a fin-clip (adipose or ventral fin) or detected as having a CWT. These Chinook are out-of-basin stray hatchery fish, are not ESA-listed and will be lethally removed. A complete description of operational protocols is provided below.

The proposed weir is a hybrid resistance board/fixed panel design utilizing fixed wooden panels (Figure 1) on the perimeter and a floating resistance board section constructed primarily of PVC pipe in the center (Figure 2) with 1 ½" spacing. An 8' x 10' aluminum live trap box will be installed between the fixed panel and resistance board section on the river-right bank (Figure 3).

Sawhorse and picket sections will be held down with ecology blocks. The resistance board sections will be anchored with duckbill anchors and cables.

Figure 1: Schematic of fixed panel component of weir.

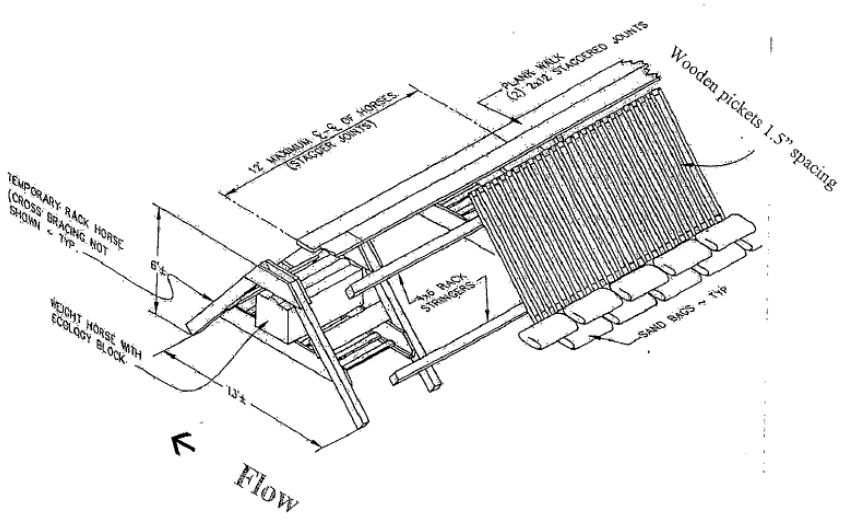


Figure 2: Schematic of resistance board component of weir

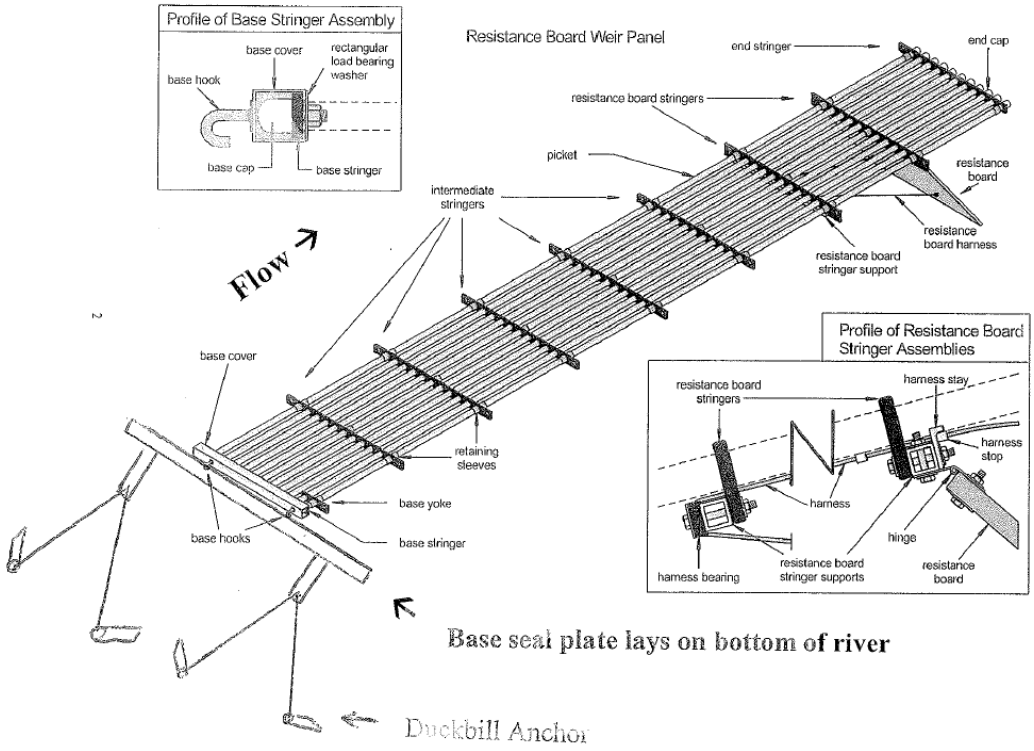
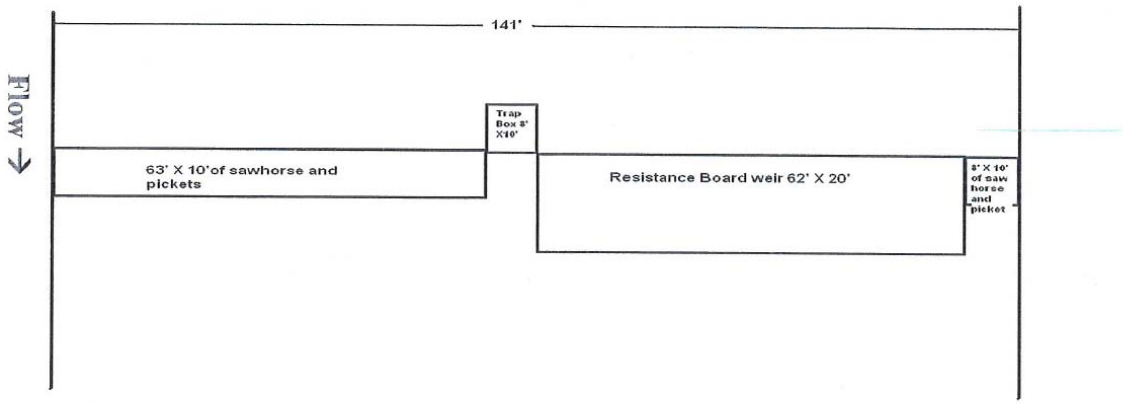
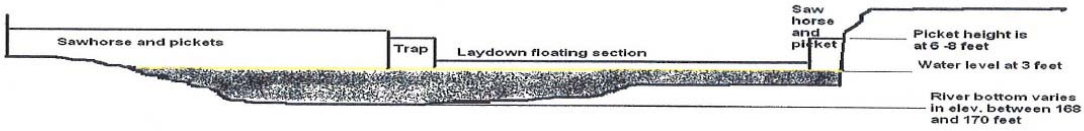


Figure 3: Hybrid resistance board/fixed panel weir design dimensions and orientation.

Overview of Trap and Weir



Elevation Plan View



b. The sampling schedule, including locations and dates if available. Be as specific as possible. Locations should be listed from general to most specific, including bodies of water, rivers, tributaries, streams or creeks, and a geographical descriptor (e.g., Columbia River, Snake River, Imnaha River, River Mile 42). Include latitude/longitude coordinates, if possible. Include 4th field hydrologic units (HUCs) whenever possible.

The weir/trap will be checked daily (multiple times daily, if necessary) and captured fish will be sampled and released. Field staff will reside at the trapping location on a rotating schedule to provide a near continuous presence at the weir from installation through removal.

The Grays River is a second order tributary entering the Columbia River at river mile (RM) 20.8. The Grays River watershed drains ~124 square miles and is a rainfall dominated system. The proposed weir location for fall 2008 is approximately 180 feet below the Grays River Covered Bridge at river mile 10.7 (Figure 4), approximately 0.9 miles above tidal influence

(near the mouth of King Creek at RM 9.8). Location information is as follows: Lat Long NAD 83 = 46.354821, -123.581436, 4th field HUC = 17080006.

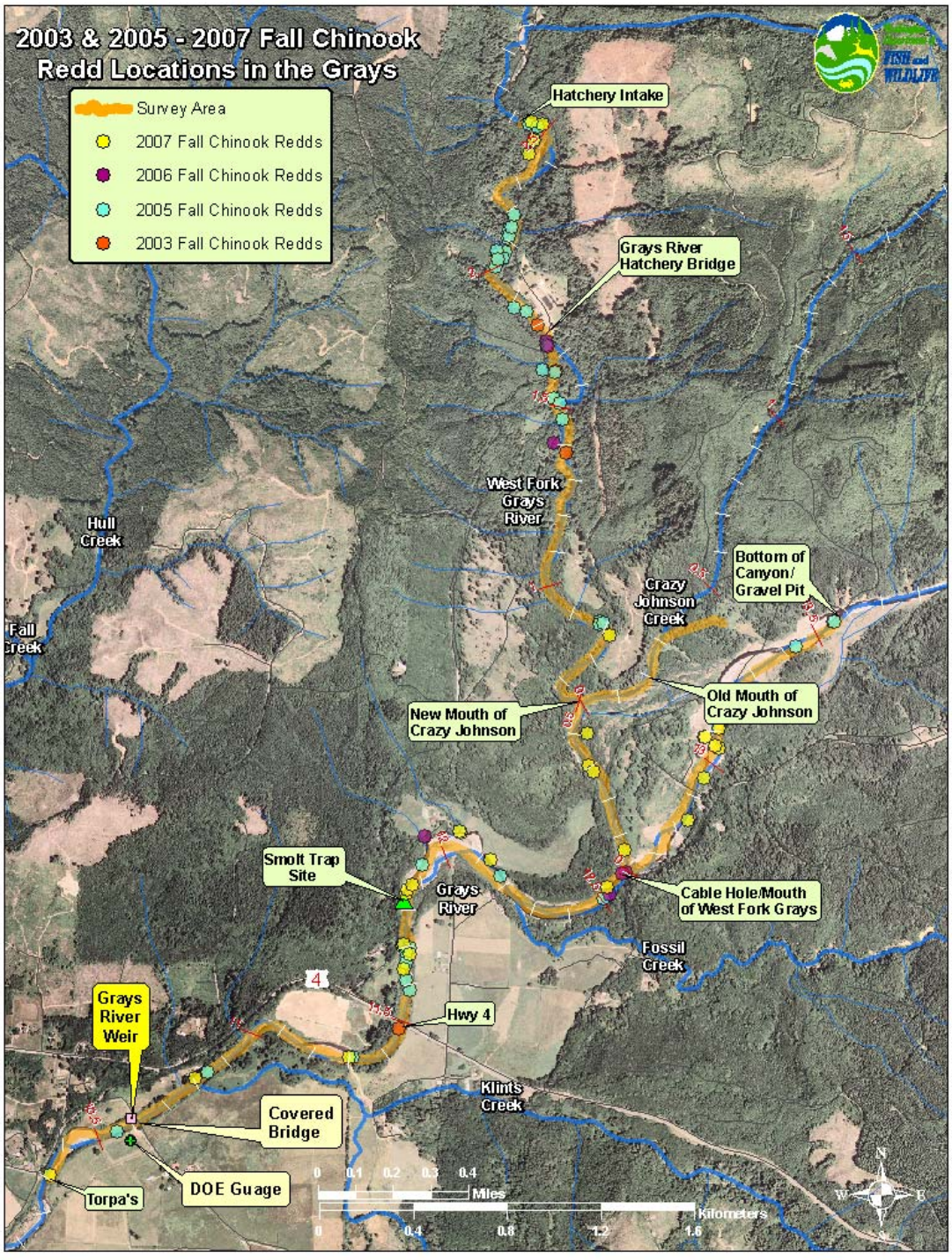


Figure 4. Proposed location of 2008 Grays River Weir; Fall Chinook redd locations in the Grays River for 2003 & 2005-2007.

c. A description of any tags, including the attachment method, location, and special handling/holding associated with the tagging;

Peterson Discs (Floy Tag Mfg., Seattle WA) – round hard plastic disc tags, attached by inserting a nickel-plated pin through the fish just behind/below the dorsal fin to secure disc to either side of the fish. Fish will be anaesthetized for this procedure.

Floy Tag T-bar Anchor Tags (Floy Tag Mfg., Seattle WA) – ~2 inch plastic tube tags with T-bar anchor, attached with a tagging gun/needle by inserting slightly behind the dorsal fin. T-bar is anchored between internal dorsal rays. Anesthetic is not required for this procedure.

Ketchum wing band tag (Kethcum Mfg. UK)– metal wing band tags applied with specialized pliers by crimping tag over the posterior edge of the operculum. Fish will be anaesthetized for this procedure.

d. A description of type and dosage of any drugs to be used, purpose of use, and method of application;

All adult salmonids that are bio-sampled, except adipose-marked coho and steelhead, will be anaesthetized using a buffered (sodium bicarbonate) MS-222 solution (at ~60mg/L) prior to handle/tagging at the weir. This is possible because the Grays River is closed to the retention of fall Chinook, chum, un-clipped (Adipose intact) coho salmon and un-clipped (Adipose intact) steelhead during the timeframe of weir operation and remains closed through the required MS-222 withdrawal period. Fish are anaesthetized by placing them in a large cooler of river water pre-treated with buffering solution and MS-222.

e. Temporary holding time prior to release of the individual(s) and the manner in which they will be detained. For transport and long-term holding, please fill out section I *Transportation and Holding*; and

The weir/trap will be checked daily (multiple times daily, if necessary) and captured fish will be sampled and released. Temporary holding time will be <24 hours.

f. Number and types of samples to be taken from each individual, including sampling protocol.

Operational /Sampling Protocols

Adults captured at the weir (all unmarked Chinook, a sub-sample of coho and chum) will need to be sampled and marked/tagged prior to release to evaluate weir efficiency and generate population estimates made at the weir. Marking/tagging will be coordinated with stream/spawning ground surveys to re-sight/recover these marks. During periods of high chum and coho salmon adult abundance only a sub-sample of their total daily/weekly trap catch may be marked to facilitate passage past the weir. Independent estimates of spawner abundance will be made via carcass tagging for comparison to the weir estimates. All adult salmonids that are bio-sampled, except adipose-marked coho and steelhead, will be anaesthetized (MS-222) prior to handle/tagging at the weir. All anaesthetized fish will be allowed to fully recover before releasing upstream of the weir.

The following outlines sampling protocols by species that will occur at the weir:

Fall Chinook:
Un-marked – designated by all fins intact and no CWT presence – **ESA listed**

- Enumerate and Pass to allow natural spawning.
- Collect biological-data (bio-data): gender, fork length, scales (three) and genetic tissue sample (fin punch) on all fish.
- Mark all bio-sampled adults with a uniquely numbered colored Peterson disc tag and apply a secondary mark (opercule punch). Change Peterson disc tag color and opercule punch weekly. The secondary mark provides an estimate of tag loss and changing the disc color and opercule mark weekly will increases the precision of population estimates.

Marked – designated by fin-clip or CWT presence – not ESA listed

- Lethally remove fin-clipped (adipose and or ventral fin clipped) fall Chinook that are captured in the adult trap. Lethally remove coded-wire tagged (CWT) fall Chinook that are trapped (CWT detected but not fin clipped). Utilize for food bank and nutrient enhancement as appropriate.
- Collect biological data (bio-data): Marks/clips, gender, post-orbital to hypural (POH) and fork lengths, scale sample (3 scales) and CWT presence/absence. The head/snout of CWT positive fish will be retained for CWT recovery.

Coho:
Unmarked - designated by all fins intact and no CWT presence – **ESA listed**

- Enumerate and Pass to allow natural spawning.
- Collect bio-data (gender, fork length and scales (six)) on a representative portion of the run. Scan and record CWT presence/absence. Collect 100-150 genetic tissue samples (fin punch) representatively across run.
- Tag all bio-sampled adults. Apply two uniquely numbered Floy tags and a secondary mark (opercule punch applied to estimate tag loss). Similar to Chinook tagging, the opercule mark will change weekly.

Marked – designated by fin-clip (Adipose) or CWT presence – **ESA listed**

- Enumerate and Pass to allow for sport-fishery.
- Collect bio-data (marks/clips, gender, fork length, and scales (six)) on a representative portion of the run. Scan and record CWT presence/absence. Sacrifice CWT positive adults for tag recovery.
- Tag all bio-sampled adults. Apply two uniquely numbered Floy tags and a secondary mark (opercule punch applied to estimate tag loss). Similar to Chinook tagging, the opercule mark will change weekly.

Steelhead
Unmarked - designated by all fins intact – not ESA listed

- Enumerate and Pass to allow natural spawning.

- Collect bio-data (gender, fork length and scales (six)) on a representative portion of the run. Collect genetic tissue sample (fin punch) on all fish.
- Tag all bio-sampled adults. Apply two uniquely numbered Floy tags.

Marked – designated by fin-clip (Adipose) – not ESA listed

- Enumerate and Pass to allow for sport fishery.
- Collect bio-data (marks/clips, gender, fork length, and scales (six)) on a representative portion of the run.
- Tag all bio-sampled adults. Apply two uniquely numbered Floy tags.

***Chum* – ESA listed**

- Enumerate and Pass to allow natural spawning.
- Collect bio-data (gender, fork length and scales (three)) on a representative portion of the run. Collect 100-150 genetic tissue samples (fin punch) representatively across run.
- Tag all bio-sampled adults. Apply a uniquely numbered Ketchum wing band tag to the opercule and a secondary mark (opercule punch applied to estimate tag loss). Similar to Chinook tagging, the opercule mark will change weekly.

Other salmonids (i.e. sockeye or pink salmon, cutthroat trout) – not ESA listed

- Enumerate and pass.
- Collect bio-data (marks/clips, gender, fork length, scales (six), and genetic tissue sample)

Non-salmonids

- Enumerate and return to stream.

3. A discussion of possible alternatives to using the proposed methods. If applicable, you should try to anticipate alternative scenarios due to circumstances such as changes in environmental conditions, annual variations in species abundance, necessary changes in proposed procedures, etc. Such scenarios should be addressed in the *Description and Estimates of Take* section below if they affect the nature or amount of potential take of listed species. This planning may avoid the potentially lengthy process of modifying the permit.

As outlined in the Operational/Sampling protocols presented above, representative sub-sampling of captured fish will be employed to facilitate passage past the weir if abundance of salmonids exceeds the ability of staff to efficiently work through fish. Close attention will be paid to the recruitment of fish into the adult trap and the accumulation of fish below the trap. If fish are not adequately moving into the trap, modifications will be made to adjust flow and try to increase trapping efficiency, or panels will be removed to allow fish passage for short intervals if fish are stacking below the weir. Marking/tagging of fish combined with stream surveys will provide a means for estimating abundance and trap efficiency if fish are allowed through the trap unsampled, or if high flows compromise the ability to trap fish at the weir.

4. A discussion of the potential for injury or mortality to the species involved, and the steps that will be taken to minimize adverse effects and to ensure that the species will be taken in a humane manner.

The highest potential for injury or mortality will likely be due to overloading of the trap box, which could be exacerbated by low flow/warm water conditions. To minimize this, the trap will be staffed nearly continuously while installed and the trap box will be checked multiple times/day, as necessary. In addition, water temperature will be monitored. If abundance of salmonids exceeds the ability of staff to efficiently work through fish, modifications to the sampling schedule/ trapping protocols will be made to facilitate passage without handling. This can be accomplished by opening the upstream gate on the trap box and allowing fish to pass through without handling, or by removing (or submerging) a panel section of the weir to allow fish passage around the trap box.

In addition, high flow events could prevent access to the trap box and limit WDFW staff's ability to handle fish, potentially trapping fish for the duration of the high flow event. The Washington Department of Ecology (DOE) operates a telemetry streamflow gauge (https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?wria=25) that can provide near real-time information on streamflows. Utilizing streamflow and weather forecast information, and direct observation WDFW personnel will determine when flows begin to limit the ability to access the trap box and sample fish. If these conditions are encountered the trap box will either be 1) opened on both the upstream and downstream end to allow direct passage through the trap, or 2) closed on both the upstream and downstream ends to prevent fish from becoming entrapped while personnel can not access the trap. Which option is chosen will depend on the extent of the high flow event, expected duration, and the trap counts (i.e. relative abundance of fish that may be impeded) in the weekly trapping period prior to the event.

Handling and tagging of fish presents another potential injury/mortality risk. To minimize this, experienced, senior level staff will be overseeing tagging and handling operations and insuring field technicians are well trained in proper fish handling techniques. In addition, anesthetic is used to calm fish during intrusive tagging procedures.

WDFW operates several adult fish traps throughout SW Washington that are not associated with hatchery operations. At these locations, fish are primarily enumerated and sampled for fish management purposes. By monitoring traps daily, including stream flows and water temperatures, and following established handling (tagging, bio-sampling, etc). procedures indirect mortality rates are minimized. Tables 10, 11, and 12 in Section H2 provide trapping/handling and mortality information for the Cedar Creek (NF Lewis tributary), Wind River, and Duncan Creek adult traps by species, respectively. Data from all three locations indicate indirect mortality rates from adult trapping and handling are generally very low ranging from 0 to 5.1% (Cedar Creek Coho, Table 10) for all species. Of the three traps, Cedar Creek handles the highest number of coho and Chinook annually and as a result has experienced the highest indirect mortality rates for these species (5.1% for coho and 3.0% for fall Chinook, Table 10). Coho and Fall Chinook trapped during the peak of spawning or later often enter the trap in poor condition (i.e. spawned out, visibly wounded, etc.), which likely contributes to an increased

mortality rate for these species. Trapping data for adult chum is limited in the LCR. The adult trap on Duncan Creek has captured a small number of chum (N=9), and has not experienced any mortalities to date. Data from WDFW adult chum seining activities on the LCR below Bonneville Dam, where a much larger number of chum are handled, tagged and bio-sampled indicate mortality rates are nearly negligible (Table 13) Grays River trapping, handling and sampling protocols will mimic procedures at these locations, and indirect mortality rates are expected to be similar.

H. **Description and Estimates of Take**: Issued permits define a specific number of individuals of each species that can be taken under the approved study or project. You must provide sufficient detail in the attached table (see last page) for NMFS to determine the species, population group, and estimated number of individuals to be taken by each activity. You should also describe the specific life stage, and origin, (and sex, if appropriate) of the listed species targeted. Take into account alternative scenarios identified above in the *Project Description, Purpose, and Significance* section.

Provide a separate table for each project, activity, or location, if appropriate. Attach the table at the end of the application. In addition, include:

1. Describe the recent status and trends of each ESU/species proposed to be taken (include citations where possible).

Biological Information:

Fall Chinook:

Fall Chinook native to the Grays River are considered a tule stock. Adults typically enter from early September through mid-November with peak spawning occurring in mid-October. Spawning occurs primarily in the lower mainstem Grays River from the canyon down to "Torpa's" (RM 10.3) and the West Fork (WF) Grays from the hatchery intake to the mouth (Figure 4). Juveniles begin emerging in January/February of the following year and emigrate as sub-yearlings from February through July (at least). Grays River fall Chinook were ESA listed as threatened in 1999 and reaffirmed in 2005 as part of the Lower Columbia Evolutionary Significant Unit (ESU) (Federal Register Notice 70 FR 37160 June, 28, 2005). WDFW's 2002 Salmonid Stock Inventory Report (SaSI, http://wdfw.wa.gov/fish/sassi/intro.htm) lists Grays River Fall Chinook as depressed.

For nearly 40 years, the Grays River Salmon Hatchery (located at RM 1.8 on the WF Grays River) raised fall Chinook for release into the Grays River. During this timeframe, broodstock from multiple sources was imported (often within a single year) to supplement Grays River returns (Table 1); these included mostly tule stocks, but "bright" stocks (i.e. Priest Rapids) were also used on occasion. The last release of fall Chinook from the Grays River Hatchery occurred in the spring of 1996 (1995 brood).

Age composition data from scale readings (1995-2006, Table 2) indicate Grays River Fall Chinook primarily return at age 3 and 4. Fall Chinook from the 1996 release returned as age 2 -

6 fish in 1997-2001. From 2002 forward, the natural spawning population was composed of natural origin fish and out-of-basin strays.

Table 1: Fall Chinook broodstock sources used at the Grays River Hatchery between 1975 and 1996.

Abernathy	Kalama
Bonneville	Klickitat
Big Creek	Priest Rapids
Cowlitz	Spring Creek
Elochoman	Toutle
Grays River	Washougal

Table 2: Grays River Fall Chinook Age composition.

Source: WDFW fall Chinook natural spawn progress reports 1995-2006, Kelly Jenkins

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	95-06
Age 2	0%	4%	14%	0%	0%	8%	4%	5%	4%	3%	18%	2%	4%
Age 3	0%	35%	14%	40%	36%	4%	50%	32%	11%	14%	34%	62%	30%
Age 4	52%	58%	71%	43%	59%	76%	46%	48%	68%	74%	32%	31%	57%
Age 5	48%	4%	0%	17%	5%	11%	0%	16%	18%	10%	17%	4%	9%
Age 6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Total N	4	25	7	27	166	24	21	6	28	84	13	54	459

Prior to 2005, estimates of Grays River fall Chinook natural spawner escapement were developed solely through peak count expansion. Stream surveys were conducted during the peak of spawning to enumerate live and dead fall Chinook; the total live and dead count was then multiplied by an expansion factor of 3.58 to estimate total escapement (Jenkins 2006). Table 3 presents peak count expansion escapement estimates from 1995-2007. In 2005, WDFW implemented a Jolly-Seber mark/recapture methodology via carcass tagging (Jolly 1965 and Seber 1965) to develop more accurate and precise estimates of escapement with confidence intervals. Estimates from this method are presented in Table 4; assumptions of this method have not yet been fully tested for these data, so estimates should be considered preliminary. Utilizing the 3-year average (2005-2007) as representative of recent returns, escapement estimates from both methods range from 70 to 390 fish, and average 75 and 214 fish from carcass tagging and peak count expansion, respectively (Tables 3 & 4).

Table 3. Grays River Fall Chinook Escapement Estimates from peak count expansion (3.58 expansion factor).

Source: WDFW fall Chinook natural spawn progress reports 1995-2007, Kelly Jenkins

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	05-07 Avg
Est.	29	365	14	93	303	97	251	82	387	745	149	390	104	214

Table 4. Grays River Fall Chinook preliminary Jolly-Seber escapement estimates via carcass tagging

Source: Todd Hillson, WDFW

	Pop. Estimate	Upper 95% CI	Lower 95% CI
2005	70	96	43

2006	71	78	64
2007	82	120	45
05-07 Avg.	75	98	51

Prior to 2007, tule fall Chinook from Lower Columbia River (LCR) hatcheries were not mass-marked with an adipose fin clip (AD-clip). AD-clips were used to identify a subset of fall Chinook from each hatchery implanted with a coded-wire-tag (CWT). CWTs are coded to identify the brood year and production facility of their host fish. In addition to LCR hatchery tule fall Chinook production, bright fall Chinook stocks are also propagated artificially for the Select Area Fishery Enhancement (SAFE) program; these fish are referred to as Select Area Brights (SABs). The SAFE program produces fish for release into Washington and Oregon terminal fishery areas near the mouth of the Columbia River. In addition to the subset of AD-clipped/CWT fish, all SABs from this program are marked with a left ventral (LV) fin clip (North et al, 2006). CWTs (and LV clips) recovered during spawning ground surveys are used to determine stock composition of the natural spawning population through CWT expansion (Jenkins 2006). Recoveries from 1995-2006, indicate SABs constitute the majority of out-of-basin fall Chinook returning to the Grays River. Other sources are fall Chinook from Oregon Department of Fish and Wildlife's (ODFW) Big Creek Hatchery and spring Chinook from the Deep River Net Pens; the latter are SAFE program fish reared at the Grays River Hatchery prior to transport to the net pens (Table 5). While the actual number of CWTs recovered annually on the Grays River has been small (range: 0 to 7 for 1995-2006, Table 5), expanding recoveries by the corresponding tag rate does provide an estimate of stock composition for the natural spawning population. Expansion of Grays River CWT recoveries by age class is presented in Table 6. The proportion of out-of-basin strays in the natural spawning population has been variable ranging from 0 to 41.6%.

Table 5. Grays River fall Chinook coded-wire-tag (CWT) and left ventral fin (LV) clipped recoveries and associated brood year/origin.

Source: WDFW fall Chinook natural spawn progress reports 1995-2007, Kelly Jenkins

SAB = "Select Area Bright" from Select Area Fishery Enhancement (SAFE) program.

Survey Year	# of recoveries	CWT/LV	Brood Yr.	Origin
1995	0	---	---	---
1996	3	CWT	1992	Grays
	1	CWT	1993	Big Creek Rogue
1997	1	CWT	1993	Grays
1998	3	LV	1993	SAB
	1	CWT	1994	Big Creek SAB
	2	LV	1994	SAB
	1	CWT	1995	Youngs Bay Rel. SAB
1999	1	CWT	1994	Grays
	1	CWT	1994	Big Creek
	1	CWT	1996	Big Creek
2000	1	LV	1998	SAB
	1	no tag		
2001	1	CWT	1999	Deep R Net Pens (sp ch)

	1	CWT	1998	Youngs Bay Rel. SAB
	1	CWT	1998	Klaskanine - SAB
2002	0	---	---	---
2003	1	CWT	1999	Deep R Net Pens (sp ch)
	1	CWT	1999	Deep R Net Pens (sp ch)
	3	LV	1999	SAB
	1			snout eaten
2004	1	CWT	2000	Klaskanine - SAB
	1	CWT	2001	Youngs Bay Rel. SAB
	1	CWT	2002	Klaskanine - SAB
	1	CWT	2000	Youngs Bay Rel. SAB
	1	no tag		
2005	1	CWT	2001	Youngs Bay Rel. SAB
	1	CWT	2001	Youngs Bay Rel. SAB
	1	CWT	2001	Klaskanine - SAB
	1	no tag	2002	
2006	1	CWT	2003	Klaskanine - SAB

Table 6. Grays River Fall Chinook Stock composition and CWT Recoveries (expanded for tag rate) by age class.

Un-marked	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Age 2	0	14	2	0	0	4	10	4	14	0	27	7
Age 3	0	113	2	30	0	4	44	26	41	71	46	160
Age 4	15	34	5	0	154	74	107	39	155	523	0	121
Age 5	14	14	0	8	0	11	0	13	69	75	25	14
Age 6	0	0	0	0	0	0	0	0	0	0	0	7
Total	29	175	9	38	154	93	161	82	279	669	98	309

Marked	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Age 2	0	0	0	0	0	4	0	0	0	19	0	0
Age 3	0	13	0	7	108	0	81	0	0	31	4	81
Age 4	0	177	5	40	26	0	9	0	108	26	47	0
Age 5	0	0	0	8	15	0	0	0	0	0	0	0
Age 6	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	190	5	55	149	4	90	0	108	76	51	81

Total ESC	29	365	14	93	303	97	251	82	387	745	149	390

Origin of Marked recoveries (expanded for tag rate)												
Klaskanine Hatch (SAB)											26	81
Youngs Bay NP - SAB										76	21	
LV clipped - SAB									37		4	
Deep R. NP							9		26			
Assumed LRH									45			
Klask Hatch + NP							81					
Big Crk &CEDC				37	18	4						
Big Creek Hatch		13			108							
Grays River Hatch		177	5	18	23							

Total	0	190	5	55	149	4	90	0	108	76	51	81
Percent out-of-basin	0.0%	3.6%	0.0%	39.8%	41.6%	4.1%	35.9%	0.0%	27.9%	10.2%	34.2%	20.8%

In 2006, a phased approach was implemented to achieve 100% marking (AD-clips) of all hatchery tule fall Chinook from LCR facilities by the spring of 2007. Fall 2008 hatchery fall Chinook returns will be comprised of age 2 fish (jacks) that are 100% mass-marked, and include age 3 fish from WDFW's Elochoman and Kalama Falls Salmon hatcheries that were mass-marked at those facilities in 2006. By 2012, all age classes (age 2-6) of LCR hatchery tule fall Chinook returning to the Columbia are scheduled to be mass-marked, with the majority (age 2-4) marked by 2010.

Chum:

The Grays River chum salmon population is one of three known self-sustaining populations remaining in the LCR (Small 2006). Grays River chum were ESA listed as threatened in 1999 and reaffirmed in 2005 as part of the Columbia River ESU (Federal Register Notice 70 FR 37160 June, 28, 2005). Adults return from late October – December with peak spawning occurring in mid-November. Spawning distribution is concentrated in Crazy Johnson Creek (West Fork Grays tributary), the lower West Fork (WF) Grays River, and the mainstem Grays River surrounding the confluence of the WF Grays (Figure 5). Fry begin emerging in February, and typically emigrate shortly after emergence. WDFW juvenile trapping data from 2008 indicates peak emigration of chum juveniles was on March 23, 2008. Preliminary estimates indicate approximately 1.8 million chum emigrated from the Grays River in 2008 (pers com Todd Hillson, WDFW). A small conservation supplementation program (~180,000 chum fry released in 2008) has occurred at the Grays River Hatchery since 1998. A thermal mark is applied to the otoliths of these fish (Volk et al 1999) to allow identification of adults upon carcass recovery. Preliminary analysis of otolith readings suggests the majority of returning adults are from natural production, with less 10 -20% of otolith recoveries showing the hatchery pattern (pers com Todd Hillson, WDFW).

Intensive adult chum monitoring has occurred in the Grays River since 2004. Population abundance estimates are generated using Jolly-Seber methodologies (Jolly 1965, Seber 1965, and Rawding et al 2002). Estimates have ranged from a high of 14,377 in 2004 to 3,832 in 2007 (Table 7). Scale readings indicate age 4 adults are the dominant age class (Table 8).

Table 7: Grays River Chum Salmon Abundance Estimates from Mark/Recapture via Carcass Tagging.

	Pop. Estimate	Upper 95% CI	Lower 95% CI
2004	14,377	15,565	13,189
2005	4,195	4,319	4,072
2006	6,115	6,391	5,839
2007	3,832	4,318	3,346
2005-07 AVG	4,714	5,009	4,419

Table 8: Grays River Chum Salmon Age Composition.

Age	2004	2005	2006	2007
3	7.0%	29.3%	22.4%	12.2%
4	88.1%	52.0%	75.5%	77.0%
5	4.9%	18.6%	2.0%	10.8%
6	0.0%	0.1%	0.1%	0.0%

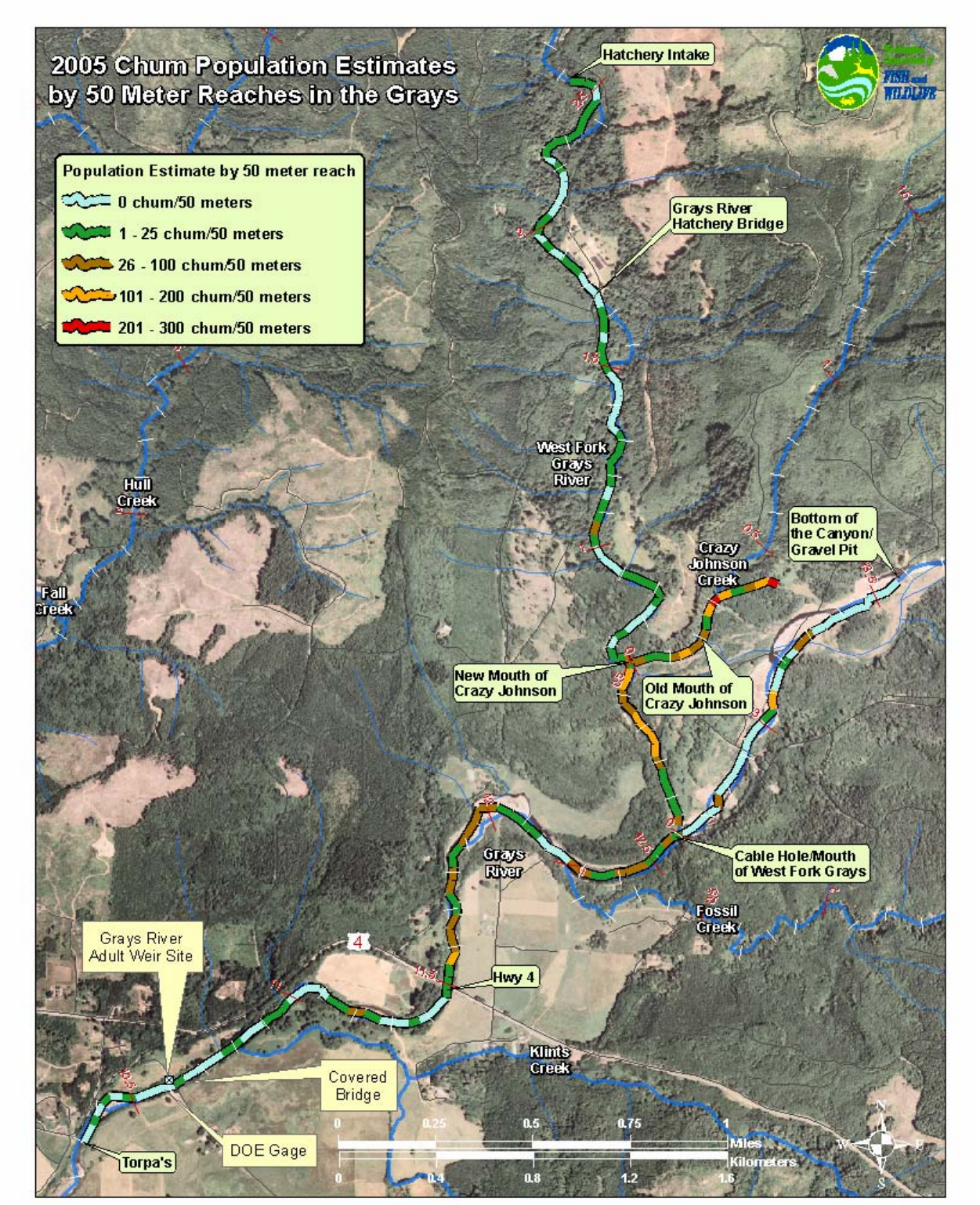


Figure 5: Grays River chum salmon spawning distribution from WDFW surveys in 2005.

Coho:

Grays River coho were ESA listed as threatened in 2005 as part of the Lower Columbia ESU. This listing includes the Grays River Hatchery early coho program (Federal Register Notice 70 FR 37160 June, 28, 2005). Coho native to the Grays River are considered Type N (late coho), and return from late October into December; historically, returns may have continued into February. Currently, WDFW does not have a comprehensive monitoring program for late coho; population abundance and spawning distribution within the Grays Basin is not well understood.

The Grays River Hatchery currently rears Type S (early) coho for the SAFE program. An onsite release of 150,000 early coho yearlings made annually into the Grays River provides for adult returns necessary to maintain broodstock for this program. Releases from this program are 100% AD-clipped. Early coho adults typically return in September and October. Fry emergence from both early and late coho typically occurs January – March. Juveniles emigrate as age 1+ (yearlings) the following April – June.

Adult early coho returning to the Grays River are trapped in the fall at the Grays River Hatchery located on the WF Grays River. Coho trapped at this facility enter volitionally. Hatchery returns represent an unknown percentage of the total return and should be considered a minimum estimate of abundance. Table 9 presents coho return data for the Grays River Hatchery for both marked and unmarked fish. These data suggest unmarked coho represent a small fraction of the adult return.

Table 9: Coho returns to the Grays River Hatchery, 2000 – 2007.

	Grays River Coho Returns AD-clipped	Grays River Coho Returns Unmarked	% Unmarked
2000	12842	0	0.0%
2001	7130	0	0.0%
2002	590	23	3.9%
2003	683	145	21.2%
2004	2221	0	0.0%
2005	4838	0	0.0%
2006	835	0	0.0%
2007	969	4	0.4%
Total 2000-07	30108	172	0.6%
2005-07 Avg	**2214**	**1**	

2. Provide a justification for all potential mortalities by take category. You should explain how you determined the numbers of listed species that would be killed, either intentionally (direct mortality, lethal take) or unintentionally (indirect mortality). You may reference section G.4. in explaining mortality rates.

No direct mortality is being requested for ESA listed fish. A discussion of potential indirect mortality rates and ways to minimize them was included in Section G.4. Grays River trapping,

handling, and sampling protocols will mimic procedures at other non-hatchery trapping locations in the LCR. Trapping data from the adult traps on Cedar Creek (NF Lewis tributary), Wind River and Duncan Creek are presented in Tables 10, 11, and 12. Table 13 provides trapping data from adult chum seining activities on the LCR below Bonneville Dam. Mortality rates for the Grays River trap are expected to be similar to those experienced at these locations (range 0 to 5.1% for all species).

Table:10: Fish Handled at Cedar Creek (NF Lewis Trib) Fishway Trap

FALL CHINOOK					SPRING CHINOOK			
Year	Total Handled	Mortalities	% Mort		Year	Total Handled	Mortalities	% Mort
2004	118	2	1.7%		2004	76	0	0.0%
2005	165	5	3.0%		2005	48	0	0.0%
2006	55	0	0.0%		2006	2	0	0.0%
2007	114	0	0.0%		2007	6	0	0.0%
total	452	7	1.5%		total	132	0	0.0%
COHO					**UNMARKED WINTER STEELHEAD**			
Year	Total Handled	Mortalities	% Mort		Year	Total Handled	Mortalities	% Mort
2004	1312	47	3.6%		2004	44	0	0.0%
2005	1090	56	5.1%		2005	34	0	0.0%
2006	1397	21	1.5%		2006	24	0	0.0%
2007	913	6	0.7%		2007	36	0	0.0%
total	4712	130	2.8%		total	138	0	0.0%

Table: 11 Wind River Adult Trap at Shipherd Falls

Wild Summer Steelhead

	handled*	tagged	morts	% mort
2003	409	370	1	0.24%
2004	422	350	0	0.00%
2005	364	307	0	0.00%
2006	326	299	0	0.00%
2007	329	296	1	0.30%
Total	1850	1622	2	0.11%
2003-07AVG	370	324.4	0.4	0.11%

Wild Winter Steelhead

	tagged	marked	morts	% mort
2003	17	17	0	0.00%
2004	28	26	0	0.00%
2005	20	19	0	0.00%
2006	21	21	0	0.00%
2007	14	14	0	0.00%
Total	100	97	0	0.00%
2003-07AVG	20	19.4	0	0.00%

Hatchery Summer Steelhead

handled	tagged	morts	% mort

	2003	28	28	0	0.00%
	2004	19	19	0	0.00%
	2005	14	14	0	0.00%
	2006	13	13	0	0.00%
	2007	2	2	0	0.00%
Total		76	76	0	0.00%
2003-07AVG		15	15	0	0.00%
		Hatchery Winter Steelhead			
		handled	**tagged**	**morts**	**% mort**
	2003	4	4	0	0.00%
	2004	1	1	0	0.00%
	2005	0	0	0	0.00%
	2006	2	2	0	0.00%
	2007	0	0	0	0.00%
Total		7	7	0	0.00%
2003-07AVG		1	1	0	0.00%
		Unmarked Tule Fall Chinook			
		handled	**tagged**	**morts**	**% mort**
	2003	20	20	0	0.00%
	2004	19	15	0	0.00%
	2005	12	11	0	0.00%
	2006	15	2	0	0.00%
	2007	4	0	0	0.00%
Total		70	48	0	0.00%
2003-07AVG		14	10	0	0.00%

Table 12: Numbers handled/tagged and mortality at the Duncan Creek adult trap.

	Chum Salmon	Indirect Mortality	Chinook Salmon	Indirect Mortality	Coho Salmon	Indirect Mortality	Steelhead	Indirect Mortality
2003	0	0	0	0	6	0	0	0
2004	2	0	3	0	112	0	7	0
2005	7	0	0	0	43	0	1	0
2006	0	0	0	0	28	0	0	0

Table 13: Mainstem Columbia River seining, tagging and broodstock collection handle and mortality – Chum Salmon

	# Seined & tagged	Indirect Mortality	# Taken for Broodstock	Indirect Mortality
2002	1,178	0	234	0
2003	2,525	0	128	0
2004	1,669	0	69	0
2005	1,068	0	59	0
2006	1,244	0	86	1
2007	515	0	28	0

3. Provide details on how all take estimates, including mortalities, were derived. Include citations when applicable.

Indirect mortality: A 3% mortality rate was applied for all species based upon trapping data presented in Tables 10-13.

Fall Chinook*:* The past five years of escapement data using both peak count expansion and mark/recapture methodologies was examined (Tables 3 and 4). The greatest estimated escapement was 745 fish in 2004 (Table 3). Through rounding, a maximum estimated take of 750 natural origin fall Chinook is requested with a 3% indirect mortality of 23 fish. The recent 3 year average escapement (2005-2007) can be used as a predictor of potential run-sizes in the short term (next 1-3 years). From mark/recapture and peak count expansion methodologies, the average 2005-07 estimates of escapement are 75 and 214, respectively (Tables 3 and 4); applying a 3% indirect mortality yields 2 and 6 fish. In addition, an estimate of projected Columbia River tributary returns of fall Chinook is generated annually by WDFW for use in setting sport and commercial fisheries. For fall Chinook, this estimate is generated using age and stock composition data from past year returns for LCR tributaries. The projected return for Grays River fall Chinook in 2008 is 39 fish (2008 Columbia River Tributary Returns Memo, Cindy LeFleur WDFW), suggesting the actual fall Chinook encounter rate at the Grays River weir in 2008 will be low.

Chum: Intensive surveys to estimate Grays River chum salmon abundance have been completed since 2004. The largest escapement from 2004 to present was in 2004 at 14,377 fish (Table 7). Through rounding, a maximum estimated take of 14,500 chum is requested with a 3% indirect mortality of 435 fish. Again utilizing the recent 3-year average as an indicator of potential short-term returns, the 2005-07 average for Grays River chum is 4714 (Table 7), suggesting the encounter rate at the weir in 2008 may be ~ 1/3 of the maximum take requested. Applying a 3% indirect mortality rate yields 141 fish.

Coho: Estimates of total coho abundance (both hatchery and wild) in the Grays River are not available. Returns to the Grays River Hatchery on the WF Grays are presented in Table 9, but should be considered minimum estimates at best. For adipose clipped (hatchery coho), recent hatchery return data was examined. In 2005, 4838 ad-clipped coho returned to the Grays Hatchery (Table 9). To estimate total take, this number was expanded by 30% to account for uncertainty in the total return. A maximum estimated take of 6300 coho is being requested for ad-clipped coho. Indirect mortality is not applicable to listed adipose clipped coho. The recent 3-year average (2005-07) hatchery return is 2214 fish, expanded by 30% this equals 2878 fish, suggesting actual short-term returns my be approximately half of the maximum take requested.

For unclipped coho (natural origin), 145 fish were collected at the Grays River Hatchery in 2003 during the early coho timeframe (Table 9). To account for uncertainty in this return, and the potential to trap into late November and early December when natural origin late coho are returning (unknown population size), an estimated take of 800 unmarked coho is being requested with a 3% indirect mortality of 24 fish.

Steelhead: *not ESA listed*

The Grays River supports a native population of winter-run steelhead. This population is part of the Southwest Washington Distinct Population Segment (DPS), which is currently not ESA listed. Return timing for wild winter-run steelhead is December through early June, with the peak of return in late April. During the proposed timeframe for trap operations in 2008, few wild steelhead are expected to be captured; however, trap operations may be expanded in the future to encompass wild steelhead return timing. Table 14 presents wild winter steelhead escapement for the Grays River from 1998 – 2007 and the recent 3-year average (2005-2007). In future years, if the weir is operated in the spring, on the order of 600 steelhead may be handled; applying a 3% indirect mortality yields 18 fish.

Table 14. Grays River wild winter steelhead population estimates from redd count expansion

Brood Year	Pop. Est.
1998	775
1999	441
2000	1064
2001	1130
2002	724
2003	1200
2004	1132
2005	396
2006	718
2007	724
2005-07 AVG	**613**

The Grays River Hatchery also releases 40,000 early winter steelhead smolts annually to support recreational fisheries. These fish originated from Chambers Creek stock and are currently collected from brood stock returning to the Elochoman Hatchery on the Elochoman River, WA. Chambers Creek stock run and spawn timing has been manipulated to occur earlier than wild winter steelhead. The majority of adults return between November and February with peak spawning in December and January (Crawford 1979). WDFW hatchery winter steelhead (Chambers Creek Stock) survival rates typically range from 1-3%, suggesting returns to the Grays River may range from 400 to 1200 fish, applying a 3% indirect mortality rate yields 12 to 36 fish, respectively. Depending on how far into November and December the weir is operational will determine what proportion of this return is encountered.

Coastal Cutthroat: not ESA listed

Picket spacing of weir panels will be 1 1/2 inches, allowing upstream and downstream passage of smaller fish. Encounters of cutthroat trout in the trap box are expected to minimal.

4. Include a statement as to whether or not any USFWS listed species would be affected. If any would be, include which species and DPS' and the authority you have to take those species (permit, consultation, agreement).

No USFWS listed species will be affected during this project

I. **Transportation and Holding**

1. **Transportation of a Listed Species**: Provide a description of how any live individuals taken from the capture site or other facility (including rescue and relocation activities) will be transported including:

Not Applicable

2. **Holding of a Listed Species**: Describe the plan for care and maintenance of any live individuals, including a complete description of the facilities where any such individuals will be maintained including:

Not Applicable

3. **Emergency contingencies**: Identify emergency contingencies- e.g., backup life support systems, alarm systems, redundant water and oxygen supply, release or destroy decision chains, etc.

Not Applicable

J. **Cooperative Breeding Program:** You MUST include a statement of willingness to participate in a cooperative breeding program and to maintain or contribute data to a breeding program, if such action is requested.

Not Applicable

K. **Previous or Concurrent Activities Involving Listed Species**:

1. Identify all previous permits where you were the permit holder or primary investigator working with federally-listed species; identify which species.

Numerous NMFS 4d rule permits have been and are currently held by Bryce Glaser and Todd Hillson to cover WDFW monitoring activities throughout Southwest Washington - Region 5. A list of permits for each can be viewed using the search function at https://apps.nmfs.noaa.gov/search/search.cfm.

Current permits pertaining to the Gray River are:
WA-2008-4395– Lower Columbia River Stock Assessment - Bryce Glaser

WA-2008-4171 Grays River Juvenile Salmonid Monitoring – Todd Hillson

2. For the above permits, list all mortality events of listed species that have occurred in the last five years.

a. List the ESU/species, life stage, origin, and population where applicable;

b. Describe the number and causes of mortalities; and

c. Describe the measures that have been taken to diminish or eliminate such mortalities, and the effectiveness of those measures.

Information pertaining to a,b and c is available for each permit at https://apps.nmfs.noaa.gov/search/search.cfm.

L. **Certification**: You must include the following paragraph, exactly as worded, followed by the applicant or responsible party's signature, name, position title, and date:

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand this information is submitted for the purpose of obtaining a permit under the Endangered Species Act of 1973 (ESA) and regulations promulgated thereunder, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or to penalties under the ESA."

_____ _____

Signature Date

Bryce Glaser – WDFW Fish Biologist 4 – Region 5

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Résumés:

Bryce Gerald Glaser

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Recent Previous Employment:

2006 – Present	Fish Biologist 4, WDFW, Southwest Region (5), Vancouver , WA.
2002 – 2006	Fish Biologist 3, WDFW, Southwest Region (5), Vancouver , WA.
1999 – 2002	Fish Biologist 2, WDFW, Southwest Region (5), Vancouver , WA.
1995 – 1999	Oceanographic Research Assistant, U. of Hawaii at Manoa, HI.
1993 – 1995	Scientific/Fisheries Technician, WDW & WDF, Southwest, WA.

Current Responsibilities: Lead biologist for the Region 5 Anadromous Fish/ ESA Unit, including wild salmon and steelhead monitoring and recovery planning/ implementation efforts in the Lower Columbia River. .

Expertise Related to Project: Seven years experience directly related to monitoring and managing steelhead and salmon populations including, utilizing mark-recapture, Area-Under-the-Curve, redd count expansion, and EMAP methodologies for adult and juvenile abundance monitoring; supervising field crews and participating in field work to accomplish the above. Work specific to the Grays River includes – adult wild winter steelhead, fall Chinook, and chum population monitoring, and juvenile salmonid outmigrant monitoring.

Selected Publications.

Rawding, D. and B. Glaser. In prep. Draft progress report: Escapement of tule fall Chinook salmon in the Coweeman River. Draft Progress report to WDFW. August 2006. 10 pp.

Rawding, D., B. Glaser, and S. VanderPloeg. 2006. 2005 adult winter steelhead abundance and distribution in Germany, Abernathy, and Mill Creeks. Wash. Dept. of Fish and Wild. Vancouver, WA. 14 pp.

Rawding, D., T. Hillson, B. Glaser, K. Jenkins, and S. VanderPloeg. 2006. Abundance and Spawning Distribution of Chinook Salmon in Mill, Abernathy, and Germany Creeks during 2005. Wash. Dept. of Fish and Wild. Vancouver, WA. 37pp.

Sharpe, C. S., and B. Glaser. 2005 Coweeman River Juvenile Salmonid Production Evaluation. Completion report to WDFW 30pp.

Todd Hillson

EDUCATION

B.S. Wildlife Science, Oregon State University, 1988

RECENT PREVIOUS EMPLOYMENT

1997 – 2000 Washington Department of Fish and Wildlife, Fisheries Biologist 2
2001 – present Washington Department of Fish and Wildlife, Fisheries Biologist 3

CURRENT RESPONSIBILITIES – Project lead for WDFW's portion of the Historic Habitat Food Web Linkage project (BPA Project #200301000). Project lead for the Reintroduction of Chum salmon into Duncan Creek (BPA Project # 200105300).

EXPERTISE – 18 years of fisheries research involving salmonids and two years of salmonid aquaculture. Work experience includes seven years conducting smolt monitoring at mainstem Columbia and Snake River hydropower facilities. Four years as the Lewis River Hatchery evaluation biologist conducting research relating hatchery operations/conditions to return rates of adult salmonids. Six years of conducting mark/recapture experiments (J-S model) to estimate adult salmonid populations. Eight years of experience conducting smolt trapping in both large and small streams using rotary screw traps and fence-panel weirs.

SELECTED PUBLICATIONS

Hillson, T. D. and Rawding, D. 2004. Reintroduction of Lower Columbia River Chum Salmon into Duncan Creek (BPA Project No. 200105300) Council 3-Step Review.

Hillson, T. D. 2004. Re-Introduction of Lower Columbia River Chum Salmon into Duncan Creek Annual Report for 2004, Report to Bonneville Power Administration, Contract No. 00007373, Project No. 200105300, 81 electronic pages, (BPA Report DOE/BP-00007373-4).

Hillson, T. D. In Prep. Re-Introduction of Lower Columbia River Chum Salmon into Duncan Creek Annual Report for 2005, Report to Bonneville Power Administration, Contract No. 00007373, Project No. 200105300.

Rawding, D. and T. D. Hillson. 2002. Population estimates for chum salmon spawning in the Mainstem Columbia River, 2002. Project 2001-05300, 47 electronic pages, (BPA Report DOE/BP-00007373-3).

Rawding, D. and T. D. Hillson. 2006. Population estimates for chum salmon spawning in the Mainstem Columbia River, 2004. Project 2001-05300. In Prep

Anticipated Annual Take

Use this table to specify anticipated types and numerical estimates of annual take for listed species during individual research or enhancement activities. Use a separate table for each discrete project or location **and label tables accordingly**. Each row must be explained in the application. All mortalities must be justified.

Location/Project: Grays River Weir

ESU/ Species and population group if appropriate	Life Stage	Origin	Take Activity	Number of Fish Requested	Requested Unintentional Mortality	Research Location	Research Period
Grays R. Fall Chin.	Adult	Natural	Capture, handle, Peterson Disc tag, bio-sample scale sample, release	750	23	Grays River Weir	Aug-Dec
Grays R. Chum	Adult	Natural	Capture, handle, Ketchum tag, bio-sample, scale sample, release	14500	435	Grays River Weir	Aug-Dec
Grays R. unmarked (wild) coho	Adult	Natural	Capture, handle, Floy tag, bio-sample, scale sample, release	800	24	Grays River Weir	Aug-Dec
Grays R. marked (hatchery) coho	Adult	Listed Hatchery Clipped Adipose	Capture, handle, Floy tag, bio-sample, scale sample, release	6300	N/A	Grays River Weir	Aug-Dec

ESU/Species: List each ESU and Species (and populations, if appropriate) you are requesting to take. Include common and scientific names.

Life Stage: Specify fry, juvenile, smolt, pre-spawned adult, post-spawned adult (also note if live or dead when captured). You may combine juvenile (fry, juvenile, smolt) life stages.

Origin: Specify if the individuals are natural (wild), listed hatchery with intact adipose fins, or listed hatchery with clipped adipose fins. Do not include unlisted hatchery fish.

Take Activity: Specify only one of the following for each line:

Collect for transport (including rescue/salvage)
Capture, handle, release
Capture, handle, tag, mark, tissue sample, and/or other invasive procedure, release
(Enter one or more intrusive procedure; you may combine or split.)
Intentional mortality (lethal take, direct mortality)
Removal (e.g., for broodstock collection)
Other take (specify)

Number of Fish Requested: Enter the number of fish that you are requesting for each Take Activity.

Requested Unintentional Mortality: Enter the number of fish that might die as an unintended result of the Take Activity. Enter it as a number OUT OF the number of fish requested for each Take Activity. Use N/A when Take Activity = Intentional mortality.

Research Location: Enter a location for each take. Identify locations that are more specific than whole project. Enter to the 4th field hydrologic unit code (HUC) whenever possible.

Research Period: Enter a range of dates. Identify dates if more specific than project as a whole.